AMENDMENTS TO THE CLAIMS:

1.(currently amended): A transmission device for predistorting a digital input signal in order to compensate nonlinear distortion produced by an amplifier, then converting said digital input signal into an analog signal, and amplifying said analog signal ~~same~~ by means of said amplifier, and transmitting the amplified analog signal ~~same~~, comprising:

a first digital/analog converter for converting said digital input signal into a first analog signal;

a distortion-compensating signal generator for generating a distortion-compensating signal from said digital input signal and a predistortion signal, said predistortion signal being generated by predistorting said digital input signal on the basis of a distortion-compensation coefficient determined from said digital input signal supplied as a reference signal, and a feedback signal fed back from the output of said amplifier;

a second digital/analog converter for converting the distortion-compensating signal generated by said distortion-compensating signal generator into a second analog signal;

an adder for adding said second analog signal to said first analog signal and supplying the added analog signal to said amplifier; and

a first phase difference compensator for compensating any phase difference in said transmission device other than phase distortion included in said nonlinear distortion of said amplifier for said feedback signal, said phase difference being detected on the basis of said feedback signal and said reference signal, and supplying ~~said~~ a phase difference-compensated feedback signal to said distortion-compensating signal generator.

2.(original): The transmission device according to claim 1 wherein said distortion-compensating signal generator comprises:

a distortion-compensation table having distortion-compensation coefficients corresponding to each power value of said digital input signal;

a distortion-compensation coefficient update unit for determining a new distortion-compensation coefficient from said reference signal, said feedback signal, and the distortion-compensation coefficient corresponding to said digital input signal and for updating said distortion-compensation table by using the newly determined distortion-compensation coefficient;

a multiplier for multiplying the distortion-compensation coefficient corresponding to said digital input signal; and

a subtracter for determining a differential signal from the output signal of said multiplier and said digital input signal, and outputting said differential signal as said distortion-compensating signal.

3.(original): The transmission device according to claim 1 wherein, when said first phase difference compensator is in a state in which said adder is not performing addition of said first analog signal and said second analog signal, when said first analog signal is output as the output signal of said adder, and in a state in which said amplifier is operating in the linear region, said first phase difference compensator detects said phase difference on the basis of said reference signal and said feedback signal, and thereby compensates for said phase difference.

4.(original): The transmission device according to claim 3 wherein said digital input signal and said reference signal are composed of in-phase component and quadrature component signals;

said feedback signal is converted to digital in-phase component and quadrature component signals and supplied to said first phase difference compensator; and

said first phase difference compensator determines the phase of said reference signal from the in-phase component and quadrature component signals that compose said reference signal, determines the phase of said feedback signal from the in-phase component and quadrature component signals that compose said feedback signal, and determines said phase difference as the difference between the phase of said reference signal and the phase of said feedback signal.

5.(currently amended): The transmission device according to claim 3 wherein said digital input signal and said reference signal are composed of in-phase component and quadrature component signals of a predetermined test pattern;

said feedback signal is converted to digital in-phase component and quadrature component signals and supplied to said first phase difference compensator; and

said first phase difference compensator determines the phase of said feedback signal from the in-phase component and quadrature component signals that compose said feedback signal, and determines said phase difference as the difference between [[the]] a predetermined phase of said test pattern signal and [[the]] a predetermined phase of said feedback signal.

6.(original): The transmission device according to claim 3 wherein said digital input signal is a test pattern signal composed of in-phase component and quadrature component signals, said quadrature component being zero;

said feedback signal is converted to digital in-phase component and quadrature component signals and supplied to said first phase difference compensator; and

said first phase difference compensator compensates said phase difference so that the quadrature component composing said feedback signal becomes zero.

7.(original): The transmission device according to claim 6 wherein said first phase difference compensator determines the sign of the quadrature component that composes said feedback signal; increments or decrements, on the basis of said sign, an internal counter in a random walk filter; increments or decrements, on the basis of the value output by the random walk filter, a phase counter that indicates a phase difference value; and performs compensation of said phase difference on the basis of the count in said phase counter.

8.(currently amended): The transmission device according to claim 4, further comprising a quadrature modulator for performing quadrature modulation of the digital in-phase component and quadrature component signals that compose said digital input signal and supplying the [[result]] modulated digital input signal to said first digital/analog converter, or performing quadrature modulation of [[the]] an analog output signal from said first digital/analog converter to generate said first analog signal and supplying the [[result]] first analog signal to said adder ~~amplifier~~;

wherein said first phase difference compensator performs compensation of said phase difference by means of shifting, by an amount corresponding to said ~~detected~~ determined phase difference, the phase of the output signal of said quadrature modulator during quadrature modulation by said quadrature modulator.

9.(currently amended): The transmission device according to claim 4, further comprising:

a quadrature demodulator for performing quadrature demodulation of the output signal of said amplifier and supplying, to said first phase difference compensator, the signal separated, by means of quadrature demodulation, into in-phase and quadrature components, ~~that compose same;~~ wherein said first phase difference compensator performs compensation of said phase difference by means of shifting, by an amount corresponding to said ~~detected~~ determined phase difference, the phase of the output signal of said quadrature demodulator during quadrature demodulation by said quadrature demodulator.

10.(currently amended): The transmission device according to claim 4 wherein said first phase difference compensator comprises a multiplier for performing multiplication of the in-phase component and quadrature component signals that compose said digital input signal by a numerical value comprising a real part and an imaginary part, said multiplier being arranged before said first digital/analog converter, wherein said ~~detected~~ determined phase difference is converted into [[a]] the numerical value, comprising [[a]] the real part and [[an]] the imaginary part, which is supplied to said multiplier.

11.(currently amended): The transmission device according to claim 4, further comprising a first frequency converter for converting the frequency band of an analog signal input to said amplifier, said first frequency converter being arranged before said amplifier,

wherein said first phase difference compensator performs compensation of said phase difference by means of shifting, by an amount corresponding to said ~~detected~~ determined phase difference, the phase of the output signal of said first frequency converter during frequency conversion by said first frequency converter.

12.(currently amended): The transmission device according to claim 4, further comprising a second frequency converter for converting the frequency band of said feedback signal, said second frequency converter being arranged after said amplifier,

wherein said first phase difference compensator performs compensation of said phase difference by means of shifting, by an amount corresponding to said ~~detected~~ determined phase difference, the phase of the output signal of said second frequency converter during frequency conversion by said second frequency converter.

13.(currently amended): The transmission device according to claim 2 further comprising:

a second phase difference compensator for detecting [[said]] a phase difference on the basis of the distortion-compensation coefficient corresponding to the power value of said digital input signal, compensating said phase difference for said feedback signal, and supplying said phase difference-compensated feedback signal to said distortion-compensating signal generator.

14.(original): The transmission device according to claim 13 wherein said second phase difference compensator is operational during the time that addition of said first analog signal and said second analog signal is being performed by said adder, and where the power value of said digital input signal is a power value corresponding to the linear region of said amplifier, a power value corresponding to maximum nonlinear distortion by said amplifier, or a power value lying between the power value corresponding to maximum nonlinear distortion by said amplifier and the power value corresponding to the boundary of the linear region and the nonlinear region.

15.(currently amended): The transmission device according to claim 14 wherein said distortion-compensation coefficient is composed of a numerical value corresponding to a real part and a numerical value corresponding to an imaginary part, and

said second phase difference compensator is operational when the power value of said digital input signal is a power value corresponding to the linear region of said amplifier, and compensates said phase difference in such a way that the real part of said distortion-compensation coefficient becomes "1" or the imaginary part of said distortion-compensation coefficient becomes "0".

16.(currently amended): The transmission device according to claim 15 wherein said second phase difference compensator compares the numerical value corresponding to the real part that composes said distortion-compensation coefficient to "1" or compares the numerical value corresponding to the imaginary part that composes said distortion-compensation coefficient to "0", increments or decrements an internal counter of a random walk filter ~~on the~~

~~basis of the~~ based on a result of [[said]] the comparison; increments or decrements, on the basis of the value output by said random walk filter, a phase counter for indicating a phase difference value; and performs compensation of said phase difference on the basis of the count value in said phase counter.

17.(currently amended): The transmission device according to claim 13, wherein said digital input signal is composed of in-phase component and quadrature component signals,

further comprising: a quadrature modulator for performing quadrature modulation of said in-phase component and quadrature component signals and supplying the [[result]] modulated digital input signal to said first digital/analog converter, or performing quadrature modulation of ~~the~~ an analog output signal from said first digital/analog converter to generate said first analog signal and supplying the [[result]] first analog signal to said adder ~~amplifier~~; and

wherein said second phase difference compensator performs compensation of said phase difference by means of shifting, by an amount corresponding to said detected phase difference, the phase of the output signal of said quadrature modulator during quadrature modulation by said quadrature modulator.

18.(currently amended): The transmission device according to claim 13, wherein said digital input signal is composed of in-phase component and quadrature component signals, wherein

said second phase difference compensator comprises: a multiplier for performing multiplication of the in-phase component and quadrature component signals that compose said digital input signal by a numerical value comprising a real part and an imaginary part, said

multiplier being arranged before said quadrature multiplier; and said detected phase difference is converted into [[a]] <u>the</u> numerical value, comprising [[a]] <u>the</u> real part and [[an]] <u>the</u> imaginary part, which is supplied to said multiplier.

19.(original): The transmission device according to claim 13, wherein said digital input signal is composed of in-phase component and quadrature component signals,

further comprising a quadrature demodulator for performing quadrature demodulation of the digital-phase component and quadrature component of said feedback signal and supplying the result to said distortion-compensating signal generator;

wherein said second phase difference compensator performs compensation of said phase difference by means of shifting, by an amount corresponding to said detected phase difference, the phase of the output signal of said quadrature demodulator during quadrature demodulation by said quadrature demodulator.

20. (original): The transmission device according to claim 13, further comprising a first frequency converter for converting the frequency band of an analog signal input to said amplifier, said first frequency converter being arranged before said amplifier,

wherein said second phase difference compensator performs compensation of said phase difference by means of shifting, by an amount corresponding to said detected phase difference, the phase of the output signal of said first frequency converter during frequency conversion by said first frequency converter.

21.(original): The transmission device according to claim 13, further comprising a second frequency converter for converting the frequency band of said feedback signal, said second frequency converter being arranged after said amplifier,

wherein said second phase difference compensator performs compensation of said phase difference by means of shifting, by an amount corresponding to said detected phase difference, the phase of the output signal of said second frequency converter during frequency conversion by said second frequency converter.

22.(currently amended): The transmission device according to claim 2, further comprising a third phase difference compensator for detecting [[said]] <u>a</u> phase difference and the phase distortion that constitutes said nonlinear distortion by said amplifier, compensating said phase distortion and said phase difference on the basis of the distortion-compensation coefficient corresponding to the power value of said digital input signal, and supplying to said distortion-compensating signal generator a feedback signal compensated for said phase distortion and said phase difference.

23. (original): The transmission device according to claim 22 wherein said third phase difference compensator is operational for all power values of said digital input signal during the time that the addition of said first analog signal and said second analog signal is being performed by said adder.

24.(currently amended): The transmission device according to claim 23 wherein said digital input signal is composed of in-phase component and quadrature component signals,

further comprising a quadrature modulator for performing quadrature modulation of said in-phase component and quadrature component signals of said digital input signal and supplying the modulated digital input signal to said first digital/analog converter, or performing quadrature modulation of ~~the~~ an analog output signal from said first digital/analog converter to generate said first analog signal and supplying the [[result]] first analog signal to said adder ~~amplifier~~; and

wherein said third phase difference compensator performs compensation of said phase distortion and said phase difference by means of shifting, by an amount corresponding to said detected phase difference, the phase of the output signal of said quadrature modulator during quadrature modulation by said quadrature modulator.

25.(currently amended): The transmission device according to claim 23 wherein said digital input signal is composed of in-phase component and quadrature component signals; and

said third phase difference compensator comprises a multiplier for performing multiplication of the in-phase component and quadrature component signals that compose said digital input signal by a numerical value, comprising a real part and an imaginary part, said multiplier being arranged before said quadrature modulator, wherein said detected phase difference is converted into [[a]] the numerical value, comprising [[a]] the real part and [[an]] the imaginary part, which is supplied to said multiplier.

26.(currently amended): A transmission method for predistorting a digital input signal in order to compensate nonlinear distortion amplifier, then converting said digital input signal into

an analog signal, and amplifying said analog signal ~~same~~ by means of said amplifier, and transmitting the amplified analog signal ~~same~~, comprising the steps of:

converting said digital input signal into a first analog signal;

generating a distortion-compensating signal from said digital input signal and a predistortion signal, said predistortion signal being generated by predistorting said digital input signal on the basis of a distortion-compensation coefficient determined from said digital input signal supplied as a reference signal, and a feedback signal fed back from the output of said amplifier;

converting the distortion-compensating signal into a second analog signal;

adding said second analog signal to said first analog signal, and supplying, to said amplifier, the analog signal resulting from this addition operation; and

compensating any phase difference ~~in said transmission device~~ other than phase distortion included in said nonlinear distortion of said amplifier for said feedback produced by an signal, said phase difference being detected on the basis of said feedback signal and said reference signal, and supplying ~~said~~ a phase difference-compensated feedback signal to said distortion-compensating signal generator.